

Date: 11/5/97

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exposing the nitrogen-bearing molecule and plasma  
[ molecule ] gas to microwave energy, therein generating an  
emission of light from the plasma [ molecule ] gas within the  
chamber,

B exposing the nitrogen-bearing molecule to the emission of  
light from the plasma [ molecule ] gas, thereby disassociating a  
nitrogen ion from the nitrogen-bearing molecule; and

placing the nitrogen ion in close proximity to a Group III  
receptor ion, such that the Group III receptor ion and the  
nitrogen ion combine to form a nitride on the substrate.

NE { 2. The method of claim 1, wherein the nitrogen-bearing  
molecule is ammonia.

3. The method of claim 1, wherein the receptor ion is  
selected from the group consisting essentially of:

aluminum;

gallium; and

indium.

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NE {

4. The method of claim 1, where the receptor ion is an alloy of a Group III element.

5. (Amended) A method of creating a layer on a substrate, comprising the steps of:

placing a substrate having a top in a chamber;

generating an excitation beam within the chamber whereby a direction of the excitation beam is substantially perpendicularly directed toward the top of the substrate;

introducing a nitrogen-bearing reactant gas that flows into the excitation beam thereby generating a plasma;

introducing an inert gas selected from the group consisting of argon, neon, mercury, and xenon into the excitation beam [ and the reactant gas ] thereby generating ultraviolet light, wherein the ultraviolet light assists in dissociating the nitrogen bearing reactant gas;

flowing [ an ionic ] the nitrogen-bearing reactant gas into the chamber across the top of the substrate, whereby the plasma interacts with the [ ionic ] nitrogen-bearing reactant gas; and

flowing a group III gas into the chamber across the top of the substrate, whereby the plasma interacts with the group III

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gas, and whereby the interaction of the plasma with the [ ionic ]  
nitrogen-bearing reactant gas and the group III gas causes a  
growth of a group III nitride layer on the substrate.

6. (Amended) The method of claim 5, wherein the nitrogen-  
bearing reactant gas is selected from a group consisting of  
ammonia and a mixture of ammonia and nitrogen.

9. The method of claim 5, wherein the group III gas is  
gallium.

10. The method of claim 5, wherein the group III gas is a  
combination of gallium and indium.

REMARKS

I. Introduction

In response to the Office Action of June 26, 1997, and in  
response to the telephone interviews with the Examiner on  
November 5, 1997, claims 1, 5, and 6 have been amended, and  
claims 7, 8, and 17-20 has been cancelled without prejudice.